BID FORM

MISSOURI DEPARTMENT OF TRANSPORTATION
GENERAL SERVICES
830 MoDOT DRIVE – P.O. BOX 270
JEFFERSON CITY, MO 65102

REQUEST NO.	1-050415
DATE	March 31, 2005
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SEALED BIDS, SUBJECT TO THE CONDITIONS ON THE REVERSE SIDE HEREOF WILL BE RECEIVED AT THIS OFFICE UNTIL

2:00 p.m. Local Time April 15, 2005

AND THEN PUBLICLY OPENED AND READ FOR FURNISHING THE FOLLOWING SUPPLIES OR SERVICES.

QUOTATIONS TO BE BASED F.O.B. MISSOURI DEPARTMENT OF TRANSPORTATION
Jefferson City, MO

DEFINITE DELIVERY DATE MUST BE SHOWN. SIGN AND RETURN BEFORE TIME SET FOR OPENING. **ALL BIDS MUST BE EXTENDED AND TOTALED.**

BUYER: Brenda Tyree **BUYER TELEPHONE:** 573-751-7482

ITEM NO.	SUPPLIES OR SERVICES	MFG. NO. OR BRAND	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	Basic Direct Shear and Residual Shear System, to meet the attached specifications.					

Submit net bid as cash discount stipulations will not be considered.

NOTE: For bid to be considered, the attachment entitled **"PREFERENCE IN PURCHASING PRODUCTS"** must be on file in this office and must be in the current calendar year.

NOTE: The attachment entitled **"MISSOURI DOMESTIC PRODUCT PROCUREMENT ACT"** certifications of compliance must be completed and submitted with your bid.

(SEE LAST PAGE FOR CONDITIONS AND INSTRUCTIONS)

In compliance with the above invitation for bids, and subject to all conditions thereof, the undersigned offer and agrees to furnish and deliver any or all the items on which prices were quoted within days after receipt of formal purchase order.

Date: _____
Telephone No.: _____
Fax No.: _____
Federal I.D. No. _____

Firm Name: _____
Address: _____
_____
By (Signature): _____
Type/Print Name _____
Title: _____

1. INTRODUCTION AND GENERAL INFORMATION

1.1 Introduction:

1.1.1 This document constitutes an invitation for competitive, sealed bids for the provision of providing a Fully Automated Direct Shear and Residual Shear System as set forth herein.

2. CONTRACTUAL REQUIREMENTS

2.1 General Requirements:

2.1.1 The contractor shall provide a Fully Automated Direct Shear and Residual Shear System for the Missouri Department of Transportation (hereinafter referred to as the "*state agency*") located at the Central Materials Laboratory, 1617 Missouri Blvd., Jefferson City, Missouri, in accordance with the provisions and requirements stated herein.

2.1.2 The contractor shall perform all services to the sole satisfaction of the state agency.

2.1.3 Unless otherwise specified herein, the contractor shall furnish all material, labor, equipment, and supplies necessary to perform the services required herein.

2.2 Specific Requirements:

2.2.1 The contractor shall provide a Fully Automated Direct Shear and Residual Shear System, which shall consist of the following. In addition, such work must be completed as specified herein by no later than May 31, 2005.

a. Three (3) direct shear and residual shear soil testing units, complete with all appropriate sensor mounting fixtures, three (3) standard circular 2.5 in diameter soil boxes, and all related testing equipment for each soil testing unit.

b. All sensors (horizontal deflection, vertical deflection, horizontal force, vertical force) for each soil testing unit.

c. Direct and residual shear control and data acquisition software and related computer interface hardware.

d. Direct and residual shear data editing and reporting software.

e. Related data acquisition equipment and computer interfaces including cabling and network communication card.

f. Installation, on-site training, and warranties.

2.2.2 The contractor's Fully Automated Direct Shear and Residual Shear System, including all related testing equipment and software shall conform with and be capable of performing testing in accordance with the most current version of the following standard test methods:

a. "Direct Shear Test of Soils Under Consolidated Drained Test Conditions" AASHTO Designation T 236 (Direct Shear)

b. "Test Method for Direct Shear Test of Soils under Consolidated Drained Conditions" ASTM D 3080 (Direct Shear)

c. US Army Corps of Engineers EM 1110-2-1906 Laboratory Soils Testing (Residual Shear).

2.2.3 The contractor shall insure that each unit of the contractor's Fully Automated Direct Shear and Residual Shear System:

a. Include a computer control and data acquisition system, appropriate sensors (and sensor interface conditioners/signal processors/A-D converters) and the load frame (and related components).

b. Be appropriately rugged to withstand a standard laboratory testing environment with a projected service life of 10-15 years.

c. Be designed to operate at a standard room temperature environment of 50-90 degrees F. The equipment shall be able to withstand temperatures of 10 to 120 degrees F for shipping and storage.

d. Use shielded electrical cables to reduce signal noise and interference that may otherwise result in undesirable effects.

e. Be equipped with all standard equipment pertinent to the test including, but not limited to, the shear box, connecting pins and adjustment screws, porous inserts, top block, load application devices, and sensor mounting assemblies.

f. Not require external connections to hydraulic, pneumatic, (or other) supplies, except standard 110V AC power.

g. Be capable of running tests with both circular and square specimen areas for testing extracted undisturbed 'thin-walled' samples as well as laboratory prepared and compacted samples on remolded clays and granular materials. The circular shear box shall be able to accommodate the standard 2.5 in. (63 mm) diameter test specimen type. Automatic computations for area correction for both boxes shall be able to be performed by the software.

h. Include a load frame shear box, appropriate sensors for the accurate and precise measurement of load, and displacement, an electronic control and data acquisition system with appropriate electronic systems, peripheral devices and connections for the administration of the test procedure and data collection.

2.2.4 The contractor's Fully Automated Direct Shear and Residual Shear System shall include relevant software and hardware to present collected information in engineering units in graphical and tabular form for purposes of engineering analysis.

2.2.5 The contractor's Fully Automated Direct Shear and Residual Shear System shall be the latest production model and be new and complete, ready for immediate operation.

2.2.6 The contractor's Fully Automated Direct Shear and Residual Shear System shall come equipped with all standard equipment pertinent to the test (i.e. shear box, porous stones, appropriate equipment for application of normal loads, and sensor mounting assemblies).

2.2.7 The contractor's Fully Automated Direct Shear and Residual Shear System must be capable of being simultaneously monitored for test control and data acquisition by one (1) computer, and run under Windows 2000 Professional operating system with network operation for data storage and printing facilities. Data must be stored in a format that is user editable in the event of run-time test errors or interruptions that result in invalid data.

a. For purposes of this document, the electronic control and data acquisition systems connected to manual testing devices or load frames are not considered as an automated system.

2.2.8 The contractor shall provide on-site installation for the Fully Automated Direct Shear and Residual Shear System, which shall be conducted by a qualified technician or engineer. Such on-site installation shall include set-up, assembly, calibration, computer program testing, system checkout, troubleshooting of components, accessories, and software to the state agency.

2.2.9 The contractor shall provide all necessary I/O cards to accept or transmit information to/from the data acquisition systems, signal processors, control devices, computer processor, etc. In addition, all of the following must be included: all relevant sensors, controls, load frames and related attachments and fittings, wiring, and related computer software to control test function, acquire data, perform test calculations (with the exception of those

requiring significant engineering judgment), and output data and graphical displays both to the screen and printed output.

2.2.10 The state agency shall provide the computer processor, monitor and computer peripherals, and related equipment such as the power cords, pointing devices, mouse, printers, keyboard, uninterruptible power supplies, etc.

a. As required elsewhere herein, related components provided by the contractor shall be shipped to the state agency with all appropriate installation instructions for the included hardware and software applications.

2.2.11 The contractor must insure that all components provided are covered under a one (1) year warranty for parts and labor from date of acceptance of completed installation.

2.2.12 The contractor shall insure that the Fully Automated Direct Shear and Residual Shear System is capable of accepting input and providing output in either U. S. Customary Units (English) or International System of Units (SI) in such that:

a. A test conducted in one unit system shall be able to be reported in either of the two unit systems.

b. Units and presentation of units shall be consistent with NIST (National Institute of Standards and Technology) guidelines. Refer to NIST Special Publication 811 "Guide for the Use of the International System of Units (SI)" or other appropriate reference documents.

c. Reporting Units available shall be consistent with the test specification and commonly used forms associated with the test (i.e. square inches and square mm; pound force/square inch and kPa).

d. Units available for use in reporting shall be consistent with those commonly applied to the test and those found in related engineering or lab procedure texts.

2.2.13 The contractor's Fully Automated Direct Shear and Residual Shear System shall include a manual override, within the computer controlled environment to allow the operator to abort/terminate the test at any point.

2.2.14 The contractor's Fully Automated Direct Shear and Residual Shear System shall include a provision to restart the test from the override point in the event that the override was used to correct an error that did not invalidate all of the test sequence, such that the test may be restarted and continued from the abort point after the offending condition has been corrected.

2.2.15 The contractor shall pre-assemble all relevant components and verify the proper functionality of all hardware, software, sensors, cables, etc. prior to distribution of the system.

2.2.16 The contractor must insure that each unit is complete, including all relevant connections, computer components, cables, power cords, electrical, electronic, and mechanical fittings, calibration blocks, sensors, consolidometer/load frame parts, mounting assemblies, tubing, etc.

2.2.17 The contractor shall insure that care is taken to ensure that each unit is properly leveled and that the neutral position of the shear box is carefully centered under the vertical loading system, at time of manufacture, to ensure proper axial application of normal stresses.

2.2.18 The contractor shall provide user manuals with the system.

a. Topics in the user manuals shall include appropriate installation overview, general operation, calibration, and troubleshooting.

b. An on-line "*help*" function shall be associated with the software. Such function shall, at a minimum, indicate where further information may be found in accompanying user manuals. The help function shall include test methodology (how to run the test) in addition to a description of relevant function keys and software controls.

c. In addition, any user manuals relevant to components of the system (i.e. computer cards, sensors, D/A converters/conditioners, the computer itself-if included in system) etc. shall be included with the system.

2.2.19 The contractor shall provide technical support by staff that has familiarity with the equipment and its operation by telephone, fax, or e-mail during regular business hours (i.e. 9 AM - 4 PM CST). Requests for technical support shall be answered within two (2) business days.

a. Mechanical problems shall be addressed in a timely manner either by replacement of the equipment or by component in the most practical method as determined by mutual agreement between the agency and the contractor.

b. Software problems (affecting system accuracy) shall be corrected, and new software issued within 21 days of the notice of malfunction.

2.3 Test Control Requirements:

2.3.1 The contractor's Fully Automated Direct Shear and Residual Shear System must be computer controlled.

a. The load frame shall be able to have loads applied and removed (controlled) by the computer control system.

b. Loading rate, as well as the number of residual test cycles, shall be controlled by the computer.

c. The computer interface shall also be able to allow the user to adjust calibration factors and the rate of data acquisition.

2.3.2 The contractor's Fully Automated Direct Shear and Residual Shear System shall have appropriate control functions to allow the operator to manipulate the location of displacement components for functions such as resetting the Fully Automated Direct Shear and Residual Shear System for a new test.

a. Vertical loads and horizontal loads/displacements shall be applied through the use of micro-stepper motors at appropriate rates and within specified tolerances (consistent with those indicated in the relevant specifications). Horizontal displacements shall be able to be applied at rates up to 2.54 mm per minute (0.1 inch per minute).

b. Vertical and horizontal loads and displacements shall be monitored by appropriate sensors that transmit the information to the data acquisition system for use in engineering calculations and real time display and recording of load, displacement, and applied stresses/strains.

c. Test control parameters (applied loads and/or displacement rates and end of test criteria) shall be adjustable during the testing sequence. The test control software shall allow the test to be aborted at any time without the loss of existing data. The test shall terminate if sensors detect an overload or *'out of range'* condition.

d. Readings, in engineering units, from test sensors shall be available for monitoring in real time on the computer control system.

e. Sensor readings shall be able to be electronically "*zeroed*" in the test control program.

f. The residual test shall run automatically and not require user intervention to initiate reversals of shear displacement direction.

2.4 Tolerance Requirements:

2.4.1 The contractor's Fully Automated Direct Shear and Residual Shear System must be capable of determining horizontal and vertical displacements to a precision of .0025 mm (.0001 in) or greater.

a. The measuring devices shall have an accurate range of a minimum of 12.7 mm (0.5 inches).

2.4.2 The contractor's Fully Automated Direct Shear and Residual Shear System must be capable of maintaining the vertical loading for the duration of appropriate testing periods (at each increment) with an accuracy of 1 N (0.22 lbf) over the range of the applied load.

a. The mechanism for load application shall be capable of applying up to a 2.225 kN load (500 lbf).

b. Sensors for reading and data acquisition of applied loads shall have an accuracy and precision of 0.025% of the sensor range.

c. The vertical and horizontal load sensors shall have a range of applied load of 0 kN to 2.225 kN load (0 lbf to 500 lbf)).

d. Time shall be recorded to the nearest second (minimum).

2.5 Data Requirements:

2.5.1 Data Acquisition Sensors - The contractor's Fully Automated Direct Shear and Residual Shear System shall measure loads using self-contained load cells or similar measuring systems which read loads directly.

a. Calibrated proving rings or mechanical spring systems coupled with digital dial gages or LVDTs or similar systems are <u>not</u> acceptable.

b. Displacements shall be measured with either digital displacement dial gages or linear variable displacement transducers (LVDTs). Such devices shall have sufficient travel and resolution for the proper and reasonable operation of the direct shear test.

2.5.2 Data Input - The contractor's Fully Automated Direct Shear and Residual Shear System shall allow data relevant to the Fully Automated Direct Shear and Residual Shear System (i.e. sensor reading intervals, test specimen dimensions, etc.) to be entered into the computer via the standard keyboard/numeric keypad interface and be determined by the user.

a. The computer control program shall provide a method for correcting input errors (i.e. use of delete, backspace, etc.).

b. The computer control program shall be designed such that an error in the input process does not require the test to be aborted and re-started from the beginning.

2.6 Calibration Requirements:

2.6.1 The contractor shall provide applicable calibration information with all sensors including instructions for use, and calibration factors, as well as any additional instructions relating to their inclusion in the data acquisition system.

a. Computer software shall be able to perform relevant corrections for system. (i.e. no post-processing shall be required).

b. Sensors and data acquisition equipment shall be of appropriate quality, construction, and durability to maintain their precision such that calibration of the apparatus be required no more frequently than on an annual basis (given typical and reasonable maintenance and use).

2.6.2 The contractor's Fully Automated Direct Shear and Residual Shear System shall have an internal process for calibrating both load and displacement sensors and shall be able to perform a linear regression analysis and graph results to determine appropriate offset and calibration constant values.

a. Calibrations certificates shall be provided for all load and displacement sensors.

2.7 Computer Environment – Hardware and Software Requirements:

2.7.1 The contractor's computer test control, data input, and reporting software must be capable of operating on a computer, with appropriate memory, hardware cards, etc. as described below:

2.7.2 The stage agency shall provide the computer to ensure compliance with state agency Information System requirements. The computer provided by the state agency shall have the following minimum system configuration:

a. Intel Pentium IV microprocessor,
b. SVGA video support
c. 40.0 GB hard drive
d. CD ROM Drive (10X min. speed)
e. Appropriate ports/card slots for D/A devices
f. Network card
g. Parallel port
h. 256 Mb minimum RAM
i. Windows 2000 Professional operating system
j. PCI type slots and USB jacks available for network control cards or systems.

2.7.3 The contractor's Fully Automated Direct Shear and Residual Shear System shall operate computer test control, data input, and reporting software applications on a standard personal computer in a standard Microsoft Windows™ based environment.

a. The software shall be either developed for or fully compatible with the Windows 2000 Professional operating system.

b. The software user interface shall incorporate standard Windows conventions (i.e. use of mouse, use of minimize and maximize window functions, 'tab' and 'arrow' keys-to move between fields, 'enter' key- to accept information, function keys, numeric keypad, standard Windows tools-such as cut, copy, paste, etc.) where relevant.

c. The user interface shall be internally consistent (i.e. if 'function key 4 [F4]' means one thing in one part of that program it shall mean that same thing in another part of the program).

d. The computer test control, data input, and reporting software program shall be compatible with Microsoft Windows Networking.

e. The computer test control data input, and reporting software program shall be able to present reports graphically on the computer screen as well as print reports (including tables and graphs) to both local and network printers and plotters.

f. The computer test control, data input, and reporting software shall be developed to be consistent and compatible throughout; each part of the program shall be integrated to provide a user friendly, intuitive, operating environment. Nomenclature of input variables shall be consistent with that used in appropriate test specifications and shall be presented clearly such that confusion is minimized (i.e. rather than "tare weight" use "weight of empty sample can [tare]").

g. The system editing and reporting software may run separately from the control and acquisition software. If the programs are separate, they shall be integrated (i.e. using the same data storage and retrieval and naming conventions) and fully compatible with one another. Other software shall not be required to manipulate data for import or export between programs (if multiple programs are used). Graphical user interfaces shall be consistent such that naming of data items in the input is consistent with naming in the output. Units of measure, significant figures, etc. shall also be consistent among all programs or program components.

h. The software program(s) shall operate in such a manner that data/results from one (or more) tests may be manipulated and reported while tests are actively controlled by the control software.

i. The computer software shall be capable of displaying real time sensor readings, in engineering units. Display of readings shall be automatically updated without user action.

j. Software shall have appropriate labeling of data, graphs, and displays. Graphs and tables shall have the test title or filename clearly associated with them such that they may be readily identified if multiple windows are open. Additionally, graphs and tables shall have appropriate headings, axes labels, column labels, etc. Values shall be accompanied by appropriate engineering units (i.e. pressure values accompanied by the engineering units, in kPa [or U.S. Customary equivalent if these units are used in the given test.]). Units of measure for such test may be found in the applicable AASHTO/ASTM/USACOE specifications.

2.8 General Test Process Function Requirements:

2.8.1 The contractor's Fully Automated Direct Shear and Residual Shear System shall be programmable by the user so that horizontal displacement or horizontal load can be automatically applied by the computer control system during the test.

a. The test shall be able to be controlled either by displacement control (standard method) or by load control.

b. The control program shall record the horizontal and vertical displacements and vertical and horizontal forces (stresses) applied to the sample.

c. The user shall be able to run tests with applied normal forces ranging from a nominal 0 (zero) to a maximum of 2.225 kN (500 lbf).

d. The system shall automatically record time, horizontal and vertical displacements, and horizontal and vertical force information at intervals determined by the user (these reading intervals shall typically be consistent with test specifications).

e. The system shall be able to monitor specimen consolidation at the beginning of the direct/residual shear test to ensure completion of primary consolidation under the applied normal load.

f. The system shall be capable of actuating a minimum of 16 residual shear steps where the displacement travel direction is reversed and data is recorded as the system cycles through a specified travel sequence. The

reversal of direction shall be automatic and not require user intervention. Additionally, the residual shear testing portion of the test shall be components of one single "*test*" and not independent tests that would require post-processing for presentation of results as a single test or manual/user post-test combination.

g. The system shall be completed based on the criteria in the following table:

CRITERIA	BASIS
Maximum time	Consolidation stage
Time for 100% DS specimen consolidation (from curve fitting) + offset time	Consolidation stage
Maximum strain obtained	Shear stage
Maximum horizontal stress reached	Shear stage
Increment ended by operator	Override

2.9 Data Acquisition, Reduction, and Data Reporting Requirements:

2.9.1 The contractor's Fully Automated Direct Shear and Residual Shear System shall perform required conversions from electrical sensor output voltages to engineering units automatically in the program background with no user input or direction required (i.e. user does not need to enter conditioner information, sensitivities, conversion factors, multipliers, etc).

a. Calculations used in the direct shear test (i.e. determinations of stresses from loads and areas) shall be performed by the system automatically.

b. Data collection, processing, computation, and related calculations and subsequent presentation of data for engineering evaluation and analysis shall be internal to the controlling and reporting software obtained under this specification. No third party software, spreadsheets, or analysis programs shall be required to evaluate, process, or present the data.

c. The data reduction and reporting software shall be capable of producing export files (ASCII text, csv, or comparable) that may be used for importing into third party software, spreadsheets, or analysis programs.

2.9.2 The contractor's Fully Automated Direct Shear and Residual Shear System shall store data in such a manner that it may be edited after completion of the test to correct errors found in the initial inputs (i.e. date, sample height, etc.) so that the test is not invalidated if these errors are discovered after the test has been completed.

a. The actual editing methodology does not have to be internal to the provided software (i.e. could be a standard text editor). The procedure shall be documented in the relevant sections of the documentation (see documentation).

b. Data shall be stored in (or be downloadable in) a standard file convention (ASCII text or similar) that allows input, viewing, and/or content manipulation by standard text editors or spreadsheets.

2.9.3 The contractor's Fully Automated Direct Shear and Residual Shear System shall provide real time test monitoring.

a. Information shall be displayed in a compatible Windows environment on the control computer. The system shall be able to graphically display horizontal force, horizontal displacement, and vertical displacement so the operator may verify the shear progress. The system shall also be able to display information pertinent to the determination of the end of primary consolidation. The system shall indicate to the operator the end of primary consolidation by time or by determination of T100 + an offset time.

b. Editing functions shall be available in the reporting software to adjust and refine graphical information (i.e. graph axes shall allow automatic or "user defined" values so specific portions of the graph may be enlarged/examined, or units of measure changed so graphical results of different tests can be compared on similar scales).

c. Previously run tests shall be able to be recalled for display by the software from archived data files.

d. Test information (tables of results or data sheets) is required.

2.9.4 The contractor shall ensure that the test shall be terminated once the Fully Automated Direct Shear and Residual Shear System determines that it has reached final parameters for the input control values (i.e. time or % strain).

a. The computer software shall have an appropriate status indicator to allow the user to know that a test is complete.

2.9.5 The contractor's Fully Automated Direct Shear and Residual Shear System shall be capable of providing printed tables of test data as output. In addition, printed graphs showing typical direct shear results (i.e. horizontal force vs. horizontal displacement and vertical displacement versus horizontal displacements are) shall be provided by the program software.

a. Graphical units (i.e. x-y axes extent/scale) shall have the option of being user adjustable for presentation on printed output. A data file suitable for import into a standard spreadsheet (i.e. text file, ASCII file, or comma/tab delimited data file) shall be available as a standard test output.

b. Printed and Data File output shall be labeled such that test name, applied stresses/load steps, and other sample or test identifying information is presented for identification of the output.

c. Previously run tests shall be able to be recalled for display by the software from archived data files.

d. Standard printed output shall be compatible with either portrait or landscape orientation of US letter (8.5 x 11 inch) paper.

e. Any internal printer drivers shall be compatible with Hewlett Packard printers; otherwise the system shall allow the use of standard Windows printing operations.

2.10 Warranty Requirements:

2.10.1 In the event the system fails to function properly, and problems, errors, or omissions are discovered, the contractor, at the contractor's expense shall provide appropriate replacement components, software modifications and re-issues, or other applicable corrections for the first twelve (12) months from date of installation.

a. All parts shall be completely functional and free of defects upon arrival. Additionally, the system shall be functional and free of defects observed in the first 30 days of system use (after complete installation and set up either by state agency personnel under the instructions of the contractor or by the contractor/contractor's representatives, as appropriate).

b. Failed components shall be exchanged in a reasonable amount of time. Such time shall not exceed 21 days (unless a special case is made between the contractor and the state agency based on product availability).

c. All warranty repairs shall be done on-site at the location of installation where practicable. If comprehensive system diagnostics, major component cleaning or replacement, or other major operations requiring specialty

work-benches, additional computer equipment, or several staff members are required, the system shall be returned to the manufacturer for work of this nature. When any system or component needs to be repaired at another location, all shipping costs shall be the responsibility of the contractor.

2.11 Demonstration and Training Requirements:

2.11.1 Within three (3) weeks after shipment of the Fully Automated Direct Shear and Residual Shear System (soil testing units and software), the contractor shall provide a one (1) business-day demonstration and training session at the state agency. Such demonstration and training session shall thoroughly demonstrate the operation of the Fully Automated Direct Shear and Residual Shear System and the ability of the system to satisfy the requirements specified herein. The contractor's training must be conducted by a qualified technician or engineer who is familiar with the installation and operation of the equipment, and shall be directed towards a technical audience of technicians who shall be operating the system, and engineers who shall be using the data generated from testing. Prior to the training session, the contractor shall insure that the system is tested, shipped, installed, and fully functional. The contractor shall provide training which includes the following:

a. Set up of equipment, connections, etc.
b. Calibration of sensors
c. Operation of load frame including test set-up control and function of direct shear and residual shear tests
d. Operation of test control software including changing units, control modes, data entry, standard direct shear and residual shear tests
e. Operation of test reporting software
f. Report adjustment, error correction, graphing, and output manipulation
g. Shear testing unit and sensor care and maintenance
h. General software and hardware troubleshooting procedures

2.12 Additional Requirements:

2.12.1 The contractor shall notify the state agency of software upgrades/updates through functional life of the Fully Automated Direct Shear and Residual Shear System.

a. Software upgrades/updates developed within one (1) year of the date of delivery shall be provided to the state agency at no additional charge.

2.13 Invoicing and Payment Requirements:

2.13.1 By no later than June 10, 2005, the contractor shall submit an invoice to the following address for the completion of all deliverables as specified herein:

Missouri Department of Transportation
Controller's Office
105 W. Capitol Ave.
P.O. Box 270
Jefferson City, MO 65102

2.13.2 The contractor shall be paid in accordance with the firm, fixed prices stated on the pricing page of this document after completion of all deliverables specified herein and acceptance by the state agency.

2.13.3 Other than the payments specified above, no other payments or reimbursements shall be made to the contractor for any reason whatsoever.

3. BID SUBMISSION INFORMATION

3.1 Submission of Bids:

3.1.1 The bidder should include three (3) additional copies along with their original bid, for a total of four (4). The front cover of the original bid should be labeled "original" and the front cover of all copies should be labeled "copy".

a. Both the original and the copies should be printed on recycled paper and double sided. All bids and copies should minimize or eliminate the use of non-recyclable materials such as plastic report covers, plastic dividers, vinyl sleeves, binding, and glue bound materials.

b. The bidder should include completed copies of each Exhibit and any other requested or required information with the mailed response.

3.2 Evaluation and Award Process:

3.2.1 After determining that a bid satisfies the mandatory requirements stated in the Invitation for Bid, the evaluator(s) shall use both objective analysis and subjective judgment in conducting a comparative assessment of the bid in accordance with the evaluation criteria stated below:

a. Cost ..... 40 points
b. Experience and Reliability ..... 30 points
c. Technical Features and Specifications – Hardware & Software ..... 30 points

3.3 Evaluation of Cost:

3.3.1 The objective evaluation of cost shall be based upon the firm, fixed prices stated on the pricing page of this document.

Cost points shall be calculated based on the sum from the above calculation using the following formula:

$$\frac{\text{Lowest Responsive Price}}{\text{Compared Price}} \times 40 = \text{Cost score points}$$

a. Bidders shall agree and understand that the quantities used in the evaluation of cost are provided solely to document how cost will be evaluated. The State of Missouri makes no guarantee regarding the accuracy of the quantities stated nor does the State of Missouri intend to imply that the figures used for the cost evaluation in any way reflect actual nor anticipated usage.

3.4 Evaluation of Bidder's Experience and Reliability:

3.4.1 Experience and reliability of the bidder's organization are considered subjectively in the evaluation process. Therefore, the bidder is advised to submit any information which documents successful and reliable experience in past performances, especially those performances related to the requirements of this IFB.

3.4.2 The bidder should provide, on Exhibit A or in any other format, the following information related to previous and current services/contracts performed by the bidder's organization and any proposed subcontractors which are similar to the requirements of this IFB, which shall include a list of all Direct Shear and Residual Shear Soil Testing Systems installed by the bidder within the past year. If the contact person listed on Exhibit A is not available or is otherwise unable to be reached during the evaluation, the listed experience may not be considered.

a. Name, address, and telephone number of client/contracting agency and a representative of that client/agency who may be contacted for verification of all information submitted;

b. Dates of the service/contract; and
c. A brief, written description of the specific prior services performed and requirements thereof.

3.5 Evaluation of Technical Features and Specifications – Hardware and Software:

3.5.1 Technical Features and Specifications – Hardware and Software are considered subjectively in the evaluation process. Therefore, the bidder is advised to submit any information which documents the feature descriptions provided as well as users manuals, and if available, demonstration versions of all proposed software related to the requirements of this IFB. Failure to provide such information may result in the bid being rejected.

3.5.2 The bidder should provide, on Exhibit B or in any other format, the information related to the technical features and specifications – Hardware and Software being proposed by the bidder.

3.5.3 In presenting the Technical Features and Specifications – Hardware and Software, the bidder should submit or describe the following:

a. a copy of the users manuals and, if available, demonstration versions of all proposed software.

b. a complete description of the systems and components being proposed.

c. manufacturers literature describing the features and capabilities of the systems and components, which provide proof that the products being proposed meet or exceed the specifications specified herein. Statements made by the bidder that are not supported by published literature shall not constitute satisfactory proof and shall not be accepted.

d. where each specification is met or exceeded by referencing the number, indexing and highlighting the corresponding information on the documentation furnished.

e. a list of all utility requirements and other customer responsibilities necessary for installation and operation of components supplied.

4. PRICING PAGE

4.1 The bidder shall provide the following firm, fixed prices for providing the equipment/services in accordance with the provisions and requirements of this IFB. All costs associated with providing the required equipment/services shall be included in the stated prices.

Item #	Description	Firm, Fixed Price
001	Fully Automated Direct Shear and Residual Shear System, as specified herein.	$_____

EXHIBIT A

PRIOR EXPERIENCE OF BIDDER

The bidder should copy and complete this form for each reference being submitted as demonstration of the bidder and subcontractor's prior experience. In addition, the bidder is advised that if the contact person listed for the reference is unable to be reached during the evaluation, the listed experience may not be considered.

Bidder/Subcontractor Name:	
Reference Information (Prior Services Performed For:)	
Name of Reference Company:	
Address of Reference Company:	
Reference Contact Person Name:	
Contact Person Phone #	
Contact Person e-mail address:	
Dates of Prior Services:	
Dollar Value of Prior Services	
Description of Prior Services Performed	

As the contact person for the reference provided above, my signature below verifies that the information presented on this form is accurate. I am available for contact by the State of Missouri for additional discussions regarding my/my company's association with the bidder referenced above:

_____ _____

Signature of Reference Contact Person *Date of Signature*

EXHIBIT B

TECHNICAL FEATURES AND SPECIFICATIONS – HARDWARE AND SOFTWARE

The bidder may use this form, or any format desired, to present a description of the technical features and specifications – hardware and software being proposed, as specified in this Invitation for Bid.